11-5855-237-13

TM 11-5855-237-13

TECHNICAL MANUAL

OPERATORS'S, ORGANIZATIONAL, AND
DIRECT SUPPORT MAINTENANCE MANUAL

FOR

NIGHT VISION SIGHT, TRIPOD MOUNTED AN/TVS-4 (NSN 5855-00-906-0994) AND AN/TVS-4A (NSN 5855-00-760-3870)

This reprint includes all changes in effect at the time of publication - Change 1.

HEADQUARTERS,
DEPARTMENT OF THE ARMY
NOVEMBER 1978

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WARNING

The image intensifier assembly phosphor screens contain toxic materials. If an assembly becomes broken, be extremely careful to avoid inhalation of the phosphor screen material and do not allow it to come in contact with the mouth or open skin wounds.

The night vision sight, tripod mounted is a precision electro-optical device. Handle carefully.

Approximately 45,000 volts exist in the image intensifier assembly when the equipment is turned on. Do not remove the eyepiece when the equipment is turned on. The image intensifier assembly will normally retain a residual high-voltage charge. This charge must be removed when the assembly is removed. A green knurled ring between the eyepiece assembly and the eyeshield indicates that shielding against radiation from the eye piece assembly has been installed. If the ring has not been installed, refer to TM 11-5855-237-23P for the NSN. Do not use the equipment until it has been modified.

TM 11-5855-237-13
C 1

CHANGE No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC *14 June 1979*

Operator's, Organizational, and Direct Support Maintenance Manual

NIGHT VISION SIGHT, TRIPOD MOUNTED
AN/TVS-4 (NSN 5855-00-906-0994)
AND
AN/TVS-4A (NSN 5855-00-760-3870)

TM 11-5855-237-13, 21 November 1978, is changed as follows:

Page 4. Following paragraph 1-6, add the following paragraph:

1-6.1. Hand Receipts

Use the hand receipts in TM 11-5855-237-13-HR for property accountability of Night Vision Sight, Tripod Mounted AN/TVS-4 and AN/TVS-4A.

Page A -2. Add the following: TM 11-5855-237-13-HR Hand Receipt Manual Covering End Item/Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) for Night Vision Sight, Tripod Mounted AN/TVS-4 and AN/TVS-4A.

By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

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NG: State AG (3); Units – Same as Active Army except allowance is one per unit.

USAR: None

For explanation of abbreviations used, see AR 310-50.

*TM 11-5855-237-13

TECHNICAL MANUAL
No. 11-5855-237-13

HEADQUARTERS
DEPARTMENT
OF THE ARMY
WASHINGTON, DC
21 November 1978

OPERATOR'S ORGANIZATIONAL, AND DIRECT SUPPORT MAINTENANCE MANUAL FOR NIGHT VISION SIGHT, TRIPOD MOUNTED AN/TVS-4 (NSN 5855-00-906-0994) AND AN/TVS-4A (NSN 5855-00-760-3870)

REPORTING OF ERRORS

You can help to improve this manual by calling attention to errors and by recommending improvements.

Your letter or DA Form 2028, Recommended Changes to Publications and Blank Forms, should be forwarded direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703.

A reply will be furnished direct to you.

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*This manual supersedes TM 11-5850-228-13, 6 April 1967, including all changes.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1–1. Scope

a. This manual describes Night Vision Sight, Tripod Mounted, AN/TVS–4 and AN/TVS–4A (night sight) (fig. 1–1) and covers its installation, operation, organizational, and direct support (DS) maintenance. It includes instructions for cleaning and inspection of the equipment and replacement of parts available at organizational and DS maintenance categories.

b. References are listed in appendix A. The integral components and basic issue items appear in appendix B. The additional items authorized for support appear in appendix C. The maintenance allocation chart (MAC) appears in appendix D. Expendable supplies and materials appear in appendix E.

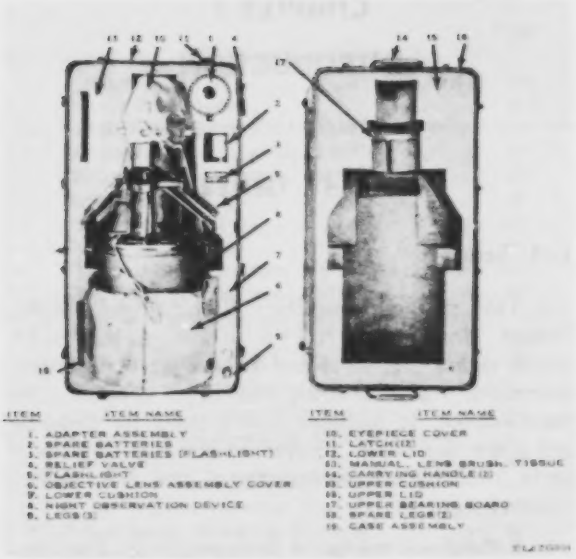

Figure 1-1. Night Vision Sight, Tripod Mounted AN/TVS-4 and TVS-4A.

1-2. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1–3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38–750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700–58/NAVSUPINST 4030.29/AFR 71–13/MCO P4030.29.A and DSAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55–38/NAVSUPINST 4610.33B/AFR 75–19/MCO P4610.19C, and DLAR 4500.15.

1–4. Administrative Storage

Administrative storage of equipment issued to and used by Army activities shall be in accordance with TM 740–90–1.

1–5. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750–244–2.

1–6. Reporting Equipment Improvement Recommendations (EIR)

EIR's will be prepared using Standard Form 368, Quality Deficiency Report. Instructions for pre-

paring EIR's are provided in TM 38–750, The Army Maintenance Management System. EIR's should be mailed direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL–ME–MQ, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

Section II. DESCRIPTION AND DATA

1–7. Description

a. General. The night sight is a transportable, battery-powered, electro-optical instrument for passive visual observation of distant targets at night. It may be used by artillery forward observers in adjusting indirect fire. The night sight uses the natural light (moonlight and/or starlight) of the night sky for target illumination and because it does not project a visible or infrared light, offers freedom from the possibility of enemy detection. It may be mounted on a small tripod for use at ground level or on a large tripod for viewing in a standing position.

b. Case Assembly. The night sight and accessories are shipped and stored in a metal case with top and bottom foam contour liners to provide maximum protection. The case assembly is fitted with 2 carrying handles, 12 latches and latch clasps, a pressure-relief valve with instruction plate, and a identification plate.

c. Night Sight. The night sight (fig. 1–2, 1–3) consists of the image tube housing assembly, objective lens assembly, objective shade assembly,

image intensifier assembly, power supply assembly, eyepiece assembly, and an adapter assembly.

(1) The image tube housing assembly is a lightweight metal frame which serves as a support housing for the other assemblies.

(2) The objective lens assembly, located on the front of the image tube housing assembly consists of an objective lens cell, five additional lens cells, and a primary mirror. The interior of the assembly is purged in an atmosphere of dry nitrogen to prevent lens fogging.

(3) The objective shade assembly is a fiberglass tubular shade which is mounted on the objective lens assembly.

(4) The image intensifier assembly is located inside the image tube housing assembly between the objective lens assembly and the eyepiece assembly.

(5) The power supply assembly consists of a power supply housing, a 6.75-volt mercury cell battery, a high-voltage oscillator, wiring, and a toggle switch.

(6) The eyepiece assembly mates into the rear of the image tube housing assembly. Either a monocular (scene visible with one eye) or biocular (scene visible with both eyes simultaneously) eyepiece may be used with the night sight. The monocular consists of seven glass elements. The biocular consists of five glass elements. The eyepiece assembly is purged in an atmosphere of dry nitrogen to prevent lens fogging. Attached to the eyepiece assembly is a rubber eyeshield which

aids in security by providing the operator with a means by covering the areas around the eye. This prevents light leaks on other areas of the face caused by the visible glow emitted from the rear of the eyepiece assembly.

(7) The adapter assembly adapts the night sight to a large tripod, or the legs supplied with the night observation device may be threaded in the adapter assembly for use as a small tripod.

d. Accessories. Shipped and stored in the case assembly as accessories to the night sight are 6.75-volt mercury batteries, a flashlight, flashlight batteries, canvas covers for the objective lens and eyepiece, legs, a lens brush, and lens paper.

(1) The 6.75-volt mercury battery provides the power required for operation of the night observation device. One battery is needed for operation of the equipment.

(2) The small pen type flashlight is provided for use in reading dials.

(3) The canvas covers are used to protect the objective lens and eyepiece lens.

(4) The legs are for use with the adapter assembly as a small tripod and as an aid in adjusting the focus ring.

(5) A lens brush and lens tissue are for cleaning the objective lens and the eyepiece lens.

e. Large Tripod Assembly. A large tripod is issued with the night sight. The length of each leg is adjustable. A canvas case (not illustrated) is supplied with the large tripod.

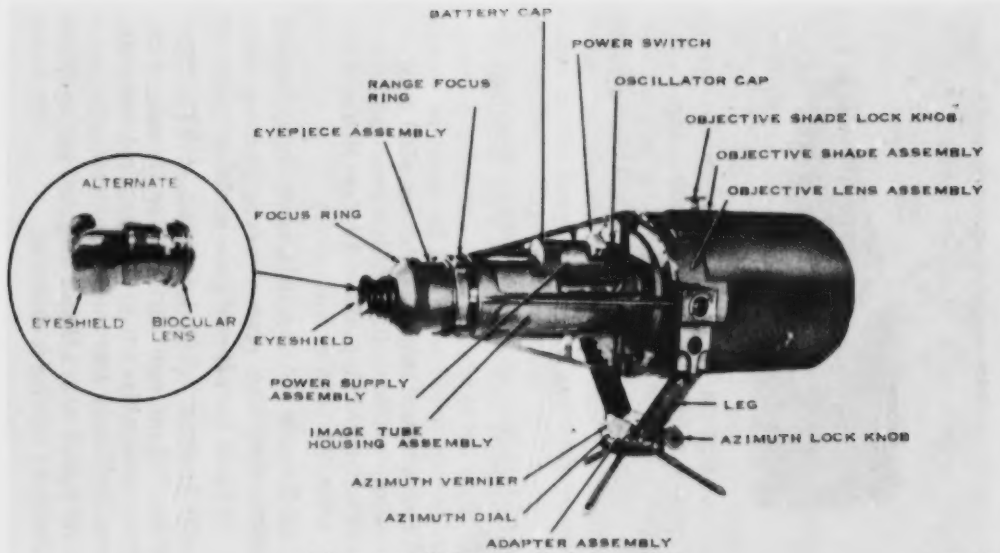

Figure 1-2. Night Sight, Right Rear View.

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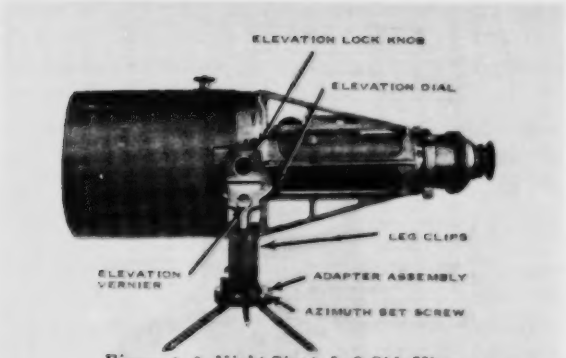


Figure 1–3. Night Sight, Left Side View

f. Installation of Adapter Ring, Eyepiece Assembly.

NOTE

The adapter ring must be installed in a clean, low humidity maintenance facility (Electronic Shop, Semi-Trailer Mounted AN/ASM–146A or equivalent).

(1) Remove the eyeshield assembly by turning it counterclockwise.

(2) Clean the exposed glass surfaces.

(3) Apply a 1-inch long bead of RTV (Dow Corning 732, or equivalent) to the threads of the eyepiece assembly, not to the eyeshield assembly. Spread uniformly over the entire thread area.

(4) Install the adapter ring on the eyepiece assembly by turning it clockwise.

(5) Clean the exposed glass surface.

(6) Install the eyeshield on the adapter ring by turning it clockwise.

1–8. Basic Functioning

The basic functions of the optical and electrical assemblies of the night sight are given below.

a. Power Supply Assembly. When the power switch is set to the on position, the 6.75-volt battery energizes the oscillator. The oscillator supplies 2800 volts ac (alternating current) to the voltage multiplier on the image intensifier assembly. The voltage multiplier ensures that each of the three stages of the image intensifier assembly receives the required voltage for operation.

b. Objective Lens Assembly. The objective lens assembly, using the ambient light of the night sky, focuses an image of the scene being viewed onto the front face (cathode) of the image intensifier assembly. Under nighttime illumination conditions, this image is very dim and not visible to the naked eye.

c. Objective Shade Assembly. The objective shade assembly prevents stray light from entering the objective lens.

d. Image Intensifier Assembly. The image intensifier assembly receives the dim image from the objective lens assembly and transmits it to the screen (anode) at the rear of the tube. This action brightens the image so that it can be seen with the naked eye.

e. Eyepiece Assembly. The eyepiece magnifies the image on the anode at the rear of the image tube. The monocular eyepiece has a focus adjust to correct for the user's eye. The biocular eyepiece is of fixed focus so the image appears to be 16 inches away from the user.

1–9. Tabulated Data

Azimuth rotation	6,400 mils.
Magnification	
Monocular	7.5 power
Biocular	4.5 power
Field of view	8°
Focus	50 meters to infinity
Temperature range	−65°F to +125°F −54°C to + 53°C
Humidity range	0 to 100%
Elevation limits	−500 to ±800 mils.
Night sight	
Length	33 in. (shade extended)
Width	12⅞ in.
Height	14¾ in.
Weight	34 lb.
Tripod	
Length	3 ft.

Width ..... 7 in.
Weight ..... 10 lb

1–10. Differences in Equipments

a. Elevation Dial. The elevation dial on serial numbers 0001 through 1026 is attached to the image tube housing with three drivescrews. The elevation dial on serial numbers 1027 through 1065 is attached to the image tube housing assembly with two drivescrews.

b. Trunnions. Trunnions on serial numbers 1001 through 1026 are secured to the image tube housing assembly with one roll pin in each trunnion. Trunnions on serial numbers 1027 through 1065 are secured to the image tube housing assembly with one capscrew in each trunnion.

c. Toggle Switch. The toggle switch on serial numbers 1001 through 1026 is secured inside the power supply housing with a cover plate and four screws which allow removal of the toggle switch without removal of the power supply housing assembly. The toggle switch on serial numbers 1027 through 1065 and 2101 and up is mounted directly on the power supply housing assembly. To remove the toggle switch, the power supply housing assembly must be removed from the focusing tube.

d. Switch Guard. There is no switch guard on serial numbers 2101 and up.

e. Range Focus Ring. The range focus ring on serial numbers 1001 through 1026 has a Teflon coating on the inside thread surface. The Teflon

coating on serial numbers 1027 through 1065 was removed and Teflon inserts were placed through the threads.

f. Elevation Vernier. The elevation vernier on serial numbers 1001 through 1065 is mounted to the yoke with the two screws located on the outside surface of the yoke.

g. Biocular Eyepiece/Monocular Eyepiece. The biocular eyepiece has fixed focus and has no diopter focus adjustment. The monocular eyepiece has focus adjustment capability. The biocular provides greater system magnification than the monocular. With the monocular the image is seen with one eye but with the biocular the image can be seen with both eyes simultaneously.

h. Biocular Monocular Eyeshield. The biocular eyeshield is stretch fitted over the eyepiece and covers both eyes. The monocular eyeshield screws on and covers only one eye.

1–11. Differences in Models

The AN/TSV–4A contains an image intensifier assembly with automatic brightness control (ABC). The ABC feature permits viewing under changing light conditions without an apparent change in scene brightness. Since the ABC image intensifier assembly includes a built-in oscillator, the AN/TVS–4A has an ABC adapter in place of the oscillator.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

2–1. Unpacking

a. General. The night sight and associated accessory items are packed in a case assembly which, in turn, is packed in a cardboard carton.

b. Unpacking. Slit the sealing tape on the top of the cardboard carton. Open the carton and lift out the case assembly.

2–2. Inspection and Service

WARNING

Before the case assembly latches are released, relieve the air pressure, as instructed on the side of the case assembly. This action releases any internal pressure in the case assembly that may have built up during storage or shipment.

a. Cut and remove the wire seals that are inserted in each of the 12 case assembly latches.

CAUTION

Unlatch all 12 latches before the lid is removed from the case assembly.

b. Release the latches and raise the lid from the case assembly. Figure 1–1 shows the night sight and accessory items packed inside the case assembly. Check the contents against the basic issue items list (app B). Report all discrepancies in accordance with TM 38–750.

CAUTION

The night sight is an electro-optical instrument and must be carefully handled at all times.

c. Install the night sight on the adapter assembly tripod (para 2–3).

d. Examine all external parts and surfaces for dust, cracks, chips, warpage, or abrasions, etc. Ensure that all nameplates, dials, verniers, and other markings are readable.

e. Remove the eyepiece canvas cover.

f. Remove the objective lens assembly canvas cover.

g. Examine the lense in the eyepiece assembly and objective housing assembly for fogginess or other signs of moisture. Note that the green adapter ring, eyeshield assembly (fig. 1–3) is installed, if not return to depot for repair.

2–3. Installation

a. *Location*. Set up the night sight on as level a surface as possible. The adapter assembly tripod has no provision for individual leg adjustment. The large tripod has adjustable legs which enable the operator to level the night sight.

b. Installation on Adapter Assembly Tripod. In-
all the night sight on the adapter assembly as
lows:

(1) Remove the three legs from the yoke.

(2) Install the legs (fig. 2–1) into the adapter
sembly.

(3) Do not remove the night sight from the
se assembly.

(4) Fit the adapter assembly (fig. 2–2) on the
ke of the night sight as shown in figure 2–2.

(5) Rotate the adapter assembly to ensure
eedom of movement on the yoke.

(6) Tighten the azimuth lock knob (fig. 2–2) to
cure the night sight to the adapter assembly
ipod.

(7) Remove the night sight from the case as-
mbly and place it on a level surface.

(8) Level the night sight, and tighten the ele-
tion lock knob (fig. 1–3).

(9) The green knurled ring is the adapter ring
eshield assembly.

c. Installation on Large Tripod. Install the night
ght on the large tripod assembly as follows:

(1) Remove the large tripod assembly from the
nvas carrying case.

(2) Set up the large tripod and install the adap-
r assembly, (fig. 2–3).

(3) Ensure that the adapter assembly is tight-
ed to prevent slippage in the tripod.

(4) Remove the night sight from the case as-

sembly and fit the bottom of the yoke over the top of the adapter assembly; slip it down until the yoke is resting securely on the adapter assembly.

(5) Tighten the azimuth lock knob (fig. 1-2) to secure the night sight to the adapter assembly.

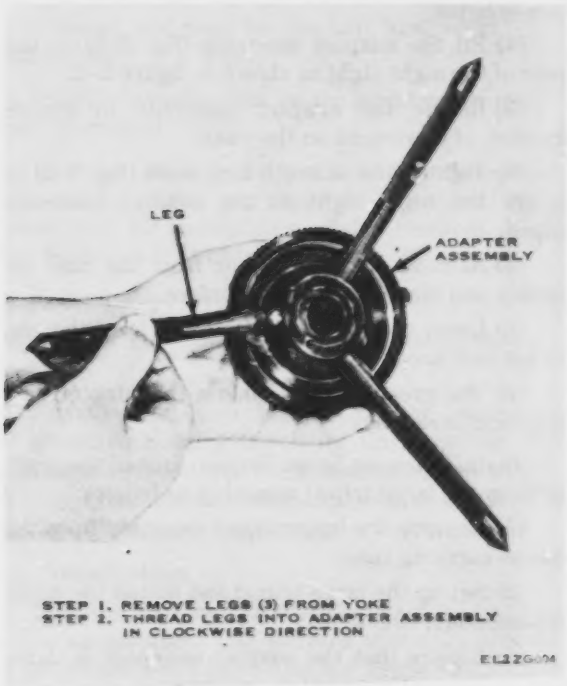


Figure 2-1. Installation of Legs on Adapter Assembly.

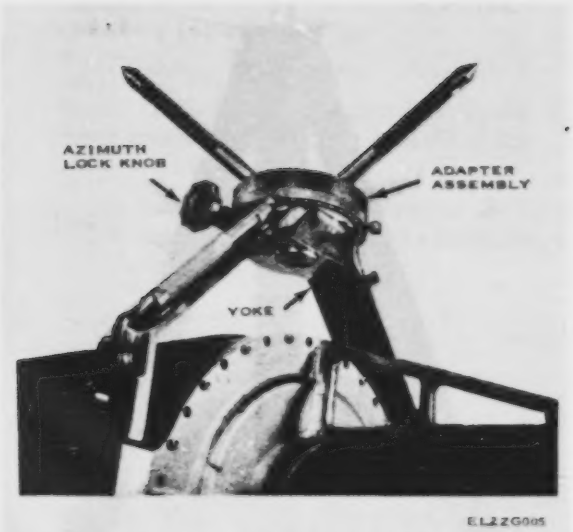
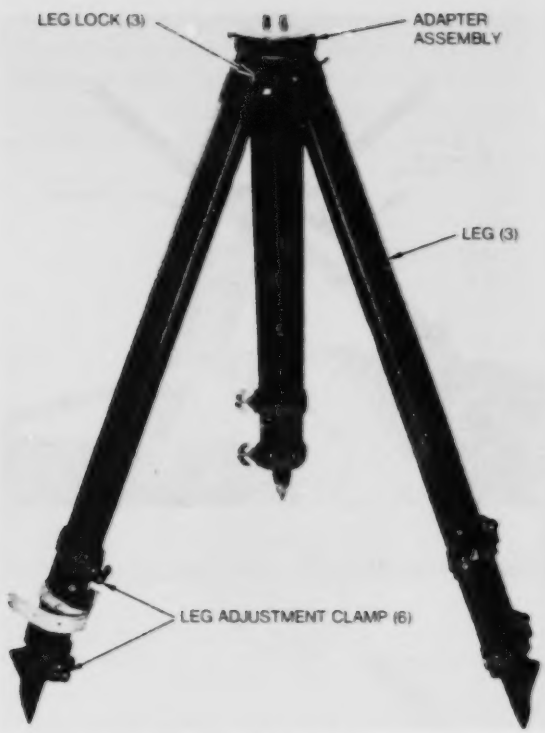


Figure 2–2. Installation of Adapter Assembly Tripod on Yoke.



STEP 1. EXTEND LEGS OF TRIPOD.

STEP 2. TIGHTEN LEG LOCKS.

STEP 3. ADJUST AND TIGHTEN LEG ADJUSTMENT CLAMPS.

STEP 4. INSTALL ADAPTER ASSEMBLY ON TRIPOD AND THREAD IN CLOCKWISE DIRECTION.

EL2ZG006

Figure 2-3. Installation of Adapter Assembly on Large Tripod.

2–4. Battery Installation

CAUTION

Ensure that the switch guard is in the down position (off) before installing the battery.

Install the battery in the night sight as shown in figure 2–4. Install the batteries in the flashlight, as shown in figure 2–5.

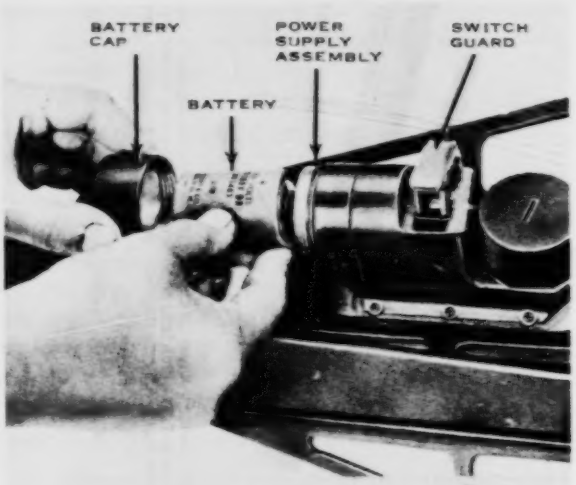

BATTERY CAP
POWER SUPPLY ASSEMBLY
SWITCH GUARD
BATTERY
STEP 1. PUSH SWITCH GUARD DOWN (POWER OFF).
STEP 2. UNSCREW AND REMOVE BATTERY CAP.
STEP 3. INSTALL BATTERY WITH PLUS (+) END INTO POWER SUPPLY ASSEMBLY.
STEP 4. REPLACE BATTERY CAP.
EL2ZG007

Figure 2–4. Night Sight Battery Installation.

BATTERIES
LAMP HEAD
FLASHLIGHT
STEP 1. REMOVE LAMP HEAD FROM FLASHLIGHT BODY
STEP 2. INSERT BATTERIES IN BODY WITH NEGATIVE (-) ENDS IN
STEP 3. INSTALL LAMP HEAD INTO FLASHLIGHT BODY

Figure 2-5. Installation of Batteries in Flashlight. EL2ZG008

2–5. Dismantling Night Sight

a. Tactical. Under conditions of foot mobility, the night sight should be dismantled and repacked in the case assembly.

(1) Inspect and ensure that the power switch is in the down position. Do not remove the battery.

(2) Loosen the objective shade lock knob (fig. 1–2), and move the shade all the way back toward the eyepiece. Retighten the objective shade lock knob.

(3) Install the canvas covers on the objective lens eyepiece assembly.

(4) Loosen the yoke mount lock knob, and remove the night sight from the adapter assembly. Replace the night sight in the case assembly.

(5) Replace the lid on the case assembly and secure all the latches.

(6) Loosen the leg lock knobs, and fold the legs on the large tripod to the folded position. Loosen the feet lock knobs and push the feet extensions all the way in the legs. Retighten the adjustable leg clamps.

(7) Replace the large tripod assembly in the canvas carrying case.

b. General. Under conditions where the night sight is not to be used for long and extended periods the night sight is to be installed in the case assembly.

CAUTION

The battery must be removed before repacking the night sight.

(1) Before removing the battery from the night sight, ensure that the power switch is in the down position.

(2) On the night sight, turn the battery cap counter-clockwise until the cap is free.

(3) Remove the battery from the battery housing by tilting the night sight.

(4) Replace the battery in the shipping container, and the battery cap on the night sight.

(5) Refer to *a*(2) through (7) above for procedures on dismantling the night sight.

2–6. Transporting Night Sight

a. The night sight, when packed in the case assembly, can be transported by two persons, by means of the carrying handles located on the case assembly, or transported in a vehicle.

b. If the tactical situation prohibits repacking the night sight, use the following methods of transporting:

(1) Mount the night sight, with its protective canvas covers, on the large tripod. Carry the night sight on your shoulders with the tripod legs pointing downward.

(2) Use a packboard.

(3) Carry the night sight by means of the yoke.

2–7. Reinstalling Night Sight

To reinstall the night sight, refer to procedures given in paragraphs 2–3 and 2–4.

Section II. CONTROLS AND INSTRUMENTS

2–8. General

Paragraphs 2–9 and 2–10 describe the operator's controls and instruments and their functions.

2–9. Purpose and Location

The location and purpose of the night sight controls and instruments are shown on figures 2–6 and 2–7.

NOTE

Figures 2–6 and 2–7 show monocular focus adjustment. The binocular eyepiece is fixed focus and, therefore, has no focus adjustment.

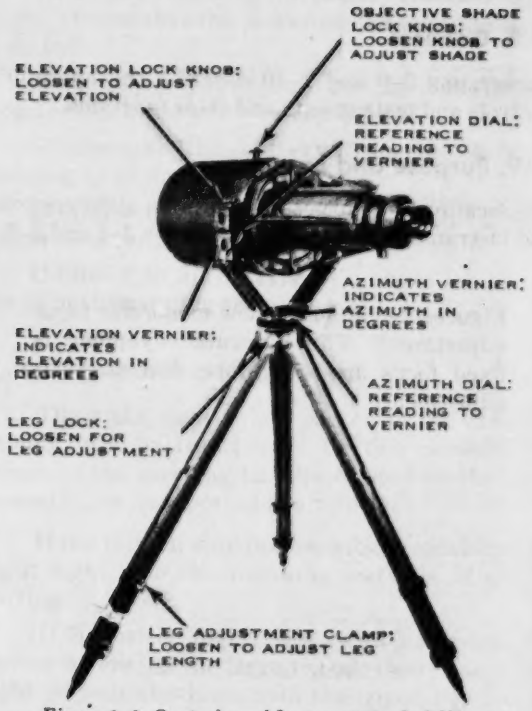

OBJECTIVE SHADE LOCK KNOB: LOOSEN KNOB TO ADJUST SHADE
ELEVATION LOCK KNOB: LOOSEN TO ADJUST ELEVATION
ELEVATION DIAL: REFERENCE READING TO VERNIER
AZIMUTH VERNIER: INDICATES AZIMUTH IN DEGREES
ELEVATION VERNIER: INDICATES ELEVATION IN DEGREES
AZIMUTH DIAL: REFERENCE READING TO VERNIER
LEG LOCK: LOOSEN FOR LEG ADJUSTMENT
LEG ADJUSTMENT CLAMP: LOOSEN TO ADJUST LEG LENGTH

Figure 2-6. Controls and Instruments, Left View.

EL2ZC009

RANGE FOCUS RING: ROTATE TO ADJUST IMAGE CLARITY
POWER SWITCH: RAISE SWITCH GUARD TO TURN POWER ON
FOCUS RING: ROTATE TO ADJUST FOR IMAGE SHARPNESS
AZIMUTH LOCK KNOB: LOOSEN TO ADJUST AZIMUTH POSITION
AZIMUTH SET SCREW: LOOSEN TO CHANGE AZIMUTH READING

Figure 2-7. Controls and Instruments, Right View.
EL2ZG010

2–10. Reticle Pattern

a. The dark line reticle pattern, as seen when looking into the eyepiece of the night sight, is shown in figure 2–8.

b. The horizontal reticle pattern consists of a dashed line. Each dash is 10 millimeters long, and each space is also 10 millimeters. In the center of the horizontal reticle is a vertical graduation which indicates the center of the field of view.

c. The vertical reticle pattern is graduated in 10-millimeter increments.

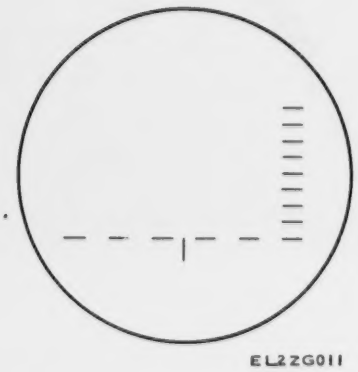


Figure 2–8. Reticle Pattern.

2–11. Operation Under Usual and Unusual Conditions

Paragraphs 2–12 through 2–18 contain detailed operating instructions for the night sight under both usual and unusual conditions.

2–12. Operating Procedures

CAUTION

Do not activate the night sight other than in nighttime or darkened room conditions because of the sensitivity of the equipment to light.

a. Refer to figure 2–9 for turning on, focusing, and turning off the night sight.

NOTE

Press your eye against the eyeshield to open the rubber security flaps.

b. Loosen the elevation lock knob (fig. 2–6), and move the eyepiece end of the night sight up or down to center vertically the object being viewed. Retighten the elevation lock knob when the image is within the field of view.

c. Loosen the azimuth lock knob (fig. 2–7), and move the eyepiece end of the night sight left or right to center horizontally the object being viewed. Retighten the azimuth lock knob when the image is within the field of view.

NOTE

The night sight has a scale and vernier for both elevation and azimuth that enables

the operator to take readings in degrees for azimuth and elevation.

d. Loosen the objective shade lock knob (fig. 2–6), and slide the objective shade back or forward for the best elimination of stray light without sacrificing viewing ability. Retighten the objective shade lock knob.

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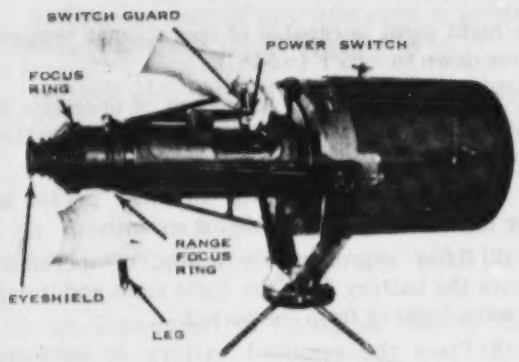


STEP 1. LIFT UP SWITCH GUARD

STEP 2. PUSH UP ON POWER SWITCH

*STEP 3. SET DIOPTER SCALE TO ZERO AND THEN ADJUST FOCUS RING FOR SHARP RETICLE IMAGE

STEP 4. ADJUST RANGE FOCUS RING FOR CLEAR OBJECT IMAGE. A SPARE LEG MAY BE USED AS AN AID IN ADJUSTING THE RANGE FOCUS RING

STEP 5. TO TURN OFF, PUSH DOWN ON SWITCH GUARD

*NOTE:
THE EYEPIECE FOCUS ADJUSTMENT ADJUSTS THE EYEPIECE FOR EACH INDIVIDUAL OPERATOR. ONCE THIS ADJUSTMENT IS MADE FOR EACH OPERATOR, NO FURTHER ADJUSTMENT SHOULD BE NECESSARY. THE BIOCULAR EYEPIECE HAS NO FOCUS ADJUSTMENT. THE IMAGE DISTANCE IS APPARENT 16 INCHES BEHIND THE LENS. IF EYEGLASSES ARE NORMALLY USED FOR READING, THEY SHOULD BE USED WITH THE BIOCULAR LENS.

Figure 2-9. Operating Procedure. EL2ZG012

2–13. Operation in Extreme Cold

The night sight is capable of operation in temperatures down to −65°F (−54°C).

a. Battery Switching. A method of operation in temperatures below −20°F is to periodically switch the batteries.

(1) Keep one battery in an inner pocket as close to your body as possible for warmth.

(2) After approximately 1 hour of operation, remove the battery from the night sight and install the warm battery from the pocket.

(3) Place the removed battery in an inner pocket, and reinstall after approximately 1 hour.

b. Lens Frosting. The lens may have a tendency to fog and frost in cold weather and will require more frequent cleaning. Avoid breathing into the eyeshield during cold weather operation.

2–14. Operation in Extreme Heat

The night sight is capable of operation in temperatures up to +125°F (+53°C).

2–15. Operation in Dusty or Sandy Areas

Operation of the night sight in dusty or sandy areas is not recommended; however, if operation in dusty or sandy areas becomes necessary, the following precautions should be followed.

a. Avoid pointing the objective lens into the wind. Dust and sand will scratch and pit the optical glass surfaces.

b. Cover as much of the night sight as possible to prevent damage to the external surfaces.

c. Keep the case assembly closed when the equipment is not being removed or replaced.

d. The eyepiece lens and the objective lens will require frequent cleaning.

e. Remove dust and sediment from the lenses with a lens brush; finish cleaning with lens paper.

2–16. Operation in Rainy or Humid Conditions

The night sight is designed for satisfactory operation without damage under rainy or humid conditions.

CAUTION

To prevent corrosion or deterioration, thoroughly dry all parts of the night sight after exposure to rain or high humidity. Clean the lenses with a lens brush and lens paper. Keep the shipping lens container closed to maintain dry liners. Do not store the night sight in a wet case assembly.

2–17. Operation in Salt Water Areas

The night sight is designed for satisfactory operation without damage under salt-spray conditions. Thoroughly clean and dry all parts after exposure to salt-spray conditions. The night sight may be immersed in fresh water to eliminate all traces of salt spray.

2–18. Operation at High Altitude

The night sight will operate satisfactorily without damage at high altitudes.

CHAPTER 3
OPERATOR MAINTENANCE

3–1. Scope of Operator's Maintenance

The maintenance duties assigned to the Operator of the night sight are listed in *a* through *d* below together with a reference to the paragraphs covering the specific maintenance function.

a. Operator's daily preventive maintenance checks and services, (table 3–1).

b. Cleaning (para 3–4).

c. Troubleshooting (para 3–5).

d. Replacing battery (fig. 2–4).

3–2. Tools and Equipment

Running spares supplied with or issued for use with the night sight are listed in appendix B. The duties assigned do not require special tools or equipment.

3–3. Operator's Preventive Maintenance

Preventive maintenance is the systematic care, service, and inspection of equipment to assure that the equipment is serviceable and to prevent the occurrence of trouble.

a. The operator's preventive maintenance checks and services chart (table 3–1) outlines functions to be performed at specific intervals. The chart lists what to check, how to check, and refers to illustrations and paragraphs that contain detailed repair or replacement procedures.

Table 3–1. Operator's Daily Preventive Maintenance Checks and Services

Sequence No.	Item to be inspected	Procedure	Reference
1	Night sight	Check for dirt and moisture on external surfaces and parts.	Para 3–4.
2	Eyepiece	Check for internal moisture or fogging.	None
3	Hardware	Check for loose screws, or bolts.	None
4	Canvas covers and tripod carrying case	Check for dirt, moisture and mildew. Service as required.	Para 3–4.
5	Cable assembly	Check for dirt, moisture and mildew. Service as required.	Para 3–4.
6	Flashlight	*a*. Check for dirt and moisture on external surfaces. *b*. Check for proper operation.	*a*. Para 3–4. *b*. None
7	Controls	Turn on and operate the night sight. Check to see that the mechanical action of each switch and control is smooth and free of external or internal binding.	Para 2–11.

If the defect cannot be remedied by the operator, a higher category of maintenance or repair is required. Record these checks in accordance with the requirements set forth in TM 38–750.

b. Operator's preventive maintenance checks and services (table 3–1) on the night sight are required daily. In addition to the routine daily checks and services, the night sight should be rechecked and serviced immediately before going on a mission and as soon after completion of the mission as possible.

3–4. Cleaning

a. Glass Surfaces. Clean the exposed glass surfaces of the objective lens assembly and eyepiece assembly by removing the loose dirt with a lens brush; then clean the glass surfaces with lens paper. Saturate the lens paper with water to remove stubborn dirt (use distilled water, if available). Dry and polish the lenses with lens paper.

b. Metal Surfaces. Clean all of the exposed metal surfaces with a lint-free cloth; dampen the cloth with water, if necessary. Allow the metal surfaces to dry thoroughly before storing the night sight.

c. Rubber Eyeshield. Clean the rubber eyeshield with a wet cloth.

d. Canvas Covers. Clean the canvas covers with a stiff brush. If the canvas covers are wet, open them for maximum exposure to air and allow them to dry thoroughly.

e. Case Assembly Cushions. Clean the exposed surfaces of the case assembly cushions with a cloth

(dampened with water if necessary). Allow the cushions to dry thoroughly before they are used.

3–5. Operator Troubleshooting

Troubleshooting by the operator is limited to replacement of the battery (fig. 2–4). Replace the battery if the sight image is weak, blurred, or not illuminated. If the battery replacement does not correct the trouble, a higher category of maintenance repair is required.

3–6. Repairs and Adjustments

No repairs or maintenance adjustments by the operator are authorized.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

4–1. Scope of Organizational Maintenance

The maintenance duties assigned to the organizational maintenance repairman are listed in *a*, *b*, and *c* below together with a reference to the paragraphs covering the specific maintenance function. These duties are performed in addition to those given in paragraphs 3–3, 3–4, and 3–5.

a. Table 4–1 lists organizational monthly preventive maintenance checks and services.

b. Replacement of eyeshield (para 4–5).

c. Replacement of adapter assembly (para 4–6).

4–2. Tools, Test Equipment, and Materials Required

A list of parts authorized for organizational maintenance appears in TM 11–5855–237–13P.

Table 4–1. Organizational Monthly Preventative Maintenance Checks and Services Chart

SEQUENCE NUMBER	ITEM TO BE INSPECTED PROCEDURE
1	NIGHT SIGHT Inspect for completeness including running spares (app B).
2	CASE ASSEMBLY AND CUSHIONS Remove cushions. Clean cushions and interior of case assembly. (para 3–4). Perform daily or weekly as required in tropical areas.
3	CANVAS COVERS Examine for evidence of rotting or weakening of the fabric by pulling or stretching (para 4–3).
4	LARGE TRIPOD Check for cracks, breakage, or damage that would weaken the tripod assembly. Check for dust and moisture (para 4–3).

4–3. Maintenance of Canvas, Wood, and Leather Items

a. Canvas Items.

(1) *Mildew.* To prevent the formation of mildew, air the canvas items for several hours. Clean mildewed items by scrubbing them with a dry, stiff brush. If water is necessary to remove the dirt, it must not be used until all the mildew has been removed.

(2) *Oil and grease.* Oil and grease can be removed from canvas items by scrubbing them with

soap and warm water. Rinse them well with clear water and allow them to dry thoroughly.

b. Wooden Surfaces. Wipe wooden surfaces with a dry clean cloth. Rub raw linseed oil into the wood to prevent dryness and to prohibit absorption of water.

c. Leather Straps. Clean leather straps with a dry, stiff brush.

4–4. Organizational Troubleshooting

Troubleshooting by the organizational maintenance repair technician is limited to the replacement of the eyeshield and adapter assemblies. If an inspection reveals other deficiencies, a higher category of maintenance repair is required.

4–5. Eyeshield

Replace the eyeshield when it is torn, cracked, or unserviceable.

a. Removal. Follow the procedures given in figure 4–1.

b. Replacement. Reverse the procedures given in figure 4–1.

c. Biocular Eyeshield. The eyeshield of the biocular is removed by gently pulling it off the lens.

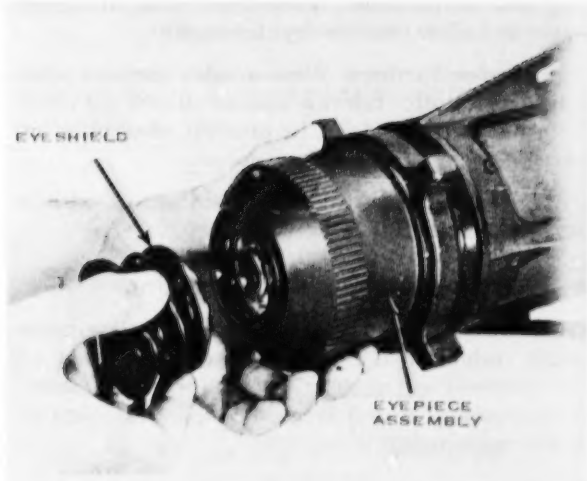

EYESHIELD
EYEPIECE ASSEMBLY
STEP 1. GENTLY GRASP EYESHIELD AND TURN IN COUNTER-CLOCKWISE DIRECTION.
STEP 2. REMOVE EYESHIELD FROM EYEPIECE ASSEMBLY.
EL2ZG013

Figure 4-1. Eyeshield Removal.

4-6. Adapter Assembly

Replace the adapter assembly if the threads are damaged, the azimuth dial is unreadable, or the bushing is damaged and renders the adapter assembly unserviceable.

CHAPTER 5
DIRECT SUPPORT MAINTENANCE

Section I. GENERAL

NOTE

The AN/TVS–4A has an ABC adapter (fig. 5–2) in place of the oscillator. The ABC adapter provides a direct connection from the ON/OFF switch to the ABC image intensifier assembly. The ABC image intensifier assembly includes a built-in oscillator.

5–1. Scope of Direct Support Maintenance

The maintenance duties assigned to the direct support maintenance repair technician are listed in *a*, *b*, and *c* below, together with a reference to the paragraphs covering the specific maintenance function. These duties are performed in addition to those assigned to the operator and organizational repair technician in paragraphs 3–3 through 3–5 and paragraphs 4–2 through 4–6.

a. Troubleshooting (para 5–6).

b. Removal and replacement (para 5–7 through 5–24).

c. Testing (para 5–3).

5–2. Tools, Test Equipment, and Materials Required

a. Special Tools. A trunnion spanner wrench is used to remove the trunnions (para 5–17). The trunnion spanner wrench is listed in TM 11–5855–237–23P.

b. Materials. Materials required for direct support maintenance appears in TM 11–5855–237–23P.

c. Test Equipment. A multimeter (Multimeter TS–352B/U or equivalent) is required for direct support maintenance of the night sight.

5–3. Testing

Perform operational test whenever the image intensifier assembly, objective lens assembly, eyepiece assembly, or electrical components have been replaced or repaired. Refer to paragraph 2–12.

5–4. Power Distribution

(fig. 5–1, 5–2 and 5–3)

The current flow through the night sight is given in *a* and *b* below.

a. Power Switch in Up Position.

(1) From the battery to the switch.

(2) From the switch to the oscillator.

(3) From the oscillator to the ground clips and to the image intensifier assembly.

(4) From the image intensifier assembly to the contact ring.

(5) From the contact ring to the adjusting sleeve.

(6) From the adjusting sleeve to the focusing tube.

(7) From the focusing tube to the ground clips.

(8) From the ground clips to the power supply housing.

(9) From the power supply housing to the battery cap.

(10) From the battery cap to the battery spring.

(11) From the battery spring to the battery.

b. Power Switch in Down Position. The power is off and no current flows.

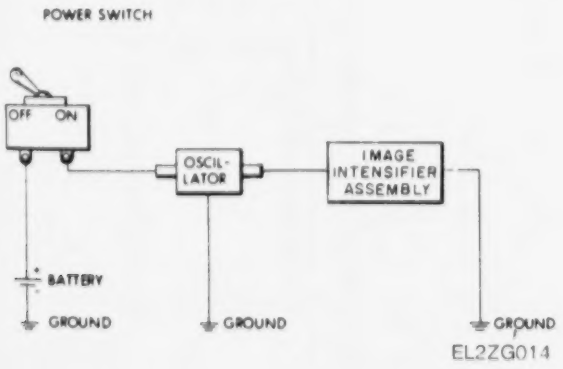


Figure 5-1. Electrical Block Diagram, AN/TVS-4

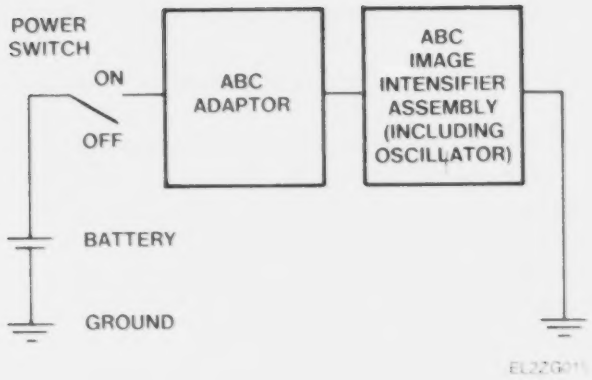


Figure 3-2. Electrical Block Diagram, AN/TVS-4A

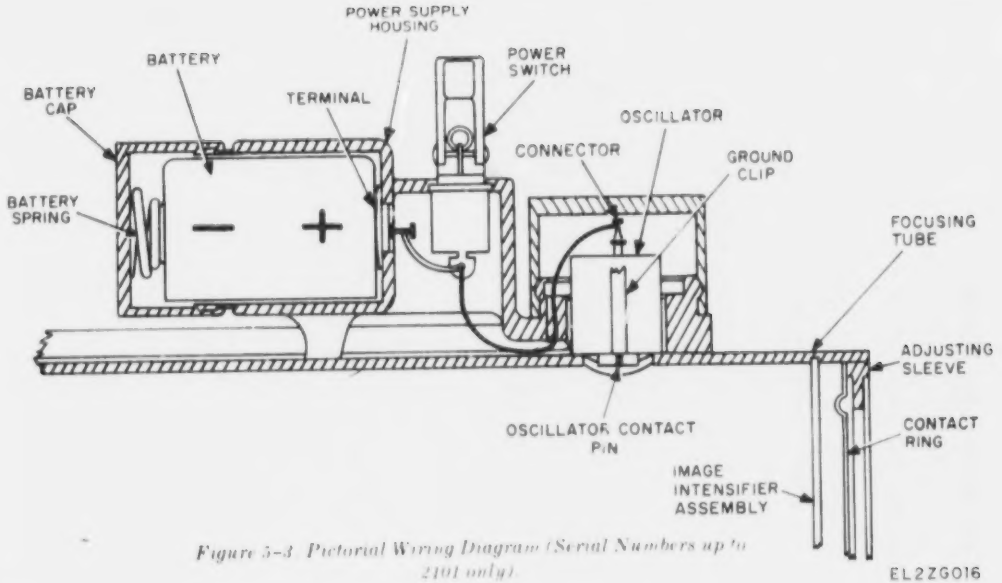


Figure 5-3. Pictorial Wiring Diagram (Serial Numbers up to 2101 only).

5–5. Continuity Check

a. The wiring and power switch (fig. 5–3) may be checked for continuity with a multimeter as follows:

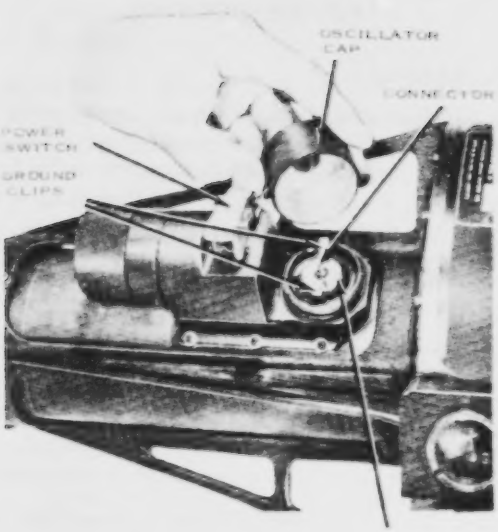
(1) Remove the battery (fig. 2–4).

(2) Remove the oscillator cap (fig. 5–4).

(3) Place the power switch in the up position.

(4) Check for continuity (0 ohm) from the terminal (battery side) to the oscillator connector.

b. If the continuity check given in *a* above reveals an open cicuit, the power switch must be removed (para 5–15) and the individual wires and the power switch must be checked for continuity.



STEP 1. REMOVE OSCILLATOR CAP IN COUNTER-CLOCKWISE DIRECTION.

STEP 2. REMOVE CONNECTOR FROM OSCILLATOR.*

STEP 3. PRESS GROUND CLIPS AWAY FROM OSCILLATOR.

STEP 4. REMOVE OSCILLATOR.

* (Not applicable to S/N 2101 & up)

CAUTION
BEFORE REPLACING OSCILLATOR, INSURE WIRE LEAD FROM CONNECTOR IS TUCKED IN CLOSE TO OSCILLATOR TO AVOID DAMAGE FROM OSCILLATOR CAP THREADS DURING INSTALLATION OF CAP.

Figure 5–4. Oscillator Removal and Replacement

Section II. DIRECT SUPPORT TROUBLESHOOTING

5–6. General

This section provides information that is useful in diagnosing and correcting unsatisfactory operation or failure of the night sight or any of its components. Each trouble symptom is followed by a list of probable faults. The corrective measure recommended is given opposite the probable trouble.

Table 5–1. Troubleshooting

Probable Fault	Corrective Measure
Blurred Image	
Defective oscillator	Replace oscillator (para 5–8).
Defective image intensifier assembly.	Replace image intensifier assembly (para 5–11).
Defective eyepiece assembly	Replace eyepiece assembly (para 5–9).
Defective objective lens assembly.	Replace objective lens assembly (para 5–14).
Weak or no illumination	
Defective oscillator	Replace oscillator (para 5–8).
Defective image intensifier	Replace image intensifier assembly (para 5–11).
Defective toggle switch	Replace toggle switch (para 5–15).
Defective contact ring	Replace contact ring (para 5–11).
Defective battery cap	Replace battery cap (para 2–4).
Defective group clips on oscillator	Replace ground clips (para 5–15).
No electrical continuity	Check continuity (para 5–5).

Section III. REMOVAL AND REPLACEMENT

5–7. General

Paragraphs 5–8 through 5–24 provide removal and replacement procedures authorized for direct support maintenance personnel. Read the entire procedure through before attempting to remove any assembly.

CAUTION

Make sure that the power switch is in the off position before any component of the night sight is removed.

5–8. Oscillator

a. Removal. Remove the oscillator, as shown in figure 5–4.

b. Testing. The only method of testing for a defective oscillator is by the substitution of a known good oscillator.

c. Replacement. Replace the oscillator by reversing the procedures given in figure 5–4.

5–9. Eyepiece Assembly

NOTE

Removal, inspection, cleaning, repair, and replacement procedures below are used for both the monocular and biocular eyepieces.

a. Removal. Remove the eyepiece assembly, as shown in figure 5–5.

b. Inspection.

(1) Inspect the exterior of the eyepiece assembly for mechanical damage.

(2) Inspect the threaded parts for burred or damaged threads.

(3) Inspect the lenses for scratches or breaks.

(4) Inspect the convolutions for damage.

(5) Inspect the 0-ring for damage or deterioration.

(6) Visually inspect the interior of the eyepiece assembly for condensation.

c. Cleaning.

(1) Clean the convolutions on the eyepiece assembly with lens tissue which has been wet with alcohol.

(2) Clean the glass and metal surfaces of the eyepiece assembly. (Refer to procedures given in paragraph 3–4.)

d. Repair.

(1) Replace the o-ring when it is damaged or deteriorated. Lubricate the o-ring with Grease, Aircraft (GPS) (MIL–L–4343).

(2) Remove the burrs from the threads with a small file or an emery cloth.

(3) Replace the eyepiece assembly when an inspection reveals condensation or damage which renders the eyepiece assembly unserviceable.

e. Replacement. Replace the eyepiece assembly by reversing the procedures given in figure 5–5.

5–10. Range Focus Ring

a. Removal. Remove the range focus ring, as shown in figure 5–5.

b. Repair. Remove the burrs from the threads with a small file or an emery cloth.

c. Replacement. Replace the range focus ring by reversing the procedures given in figure 5–5.

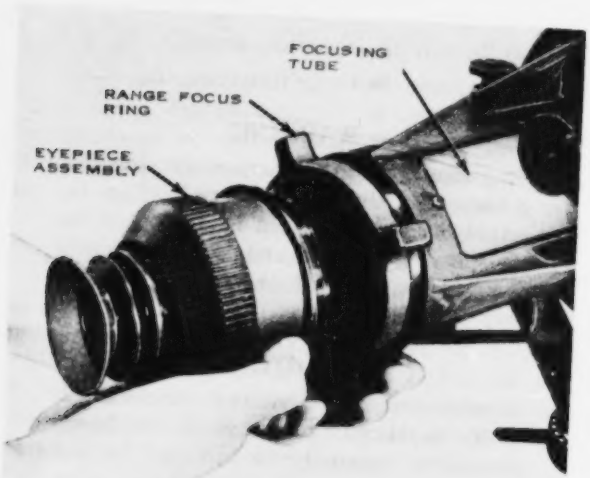

FOCUSING TUBE
RANGE FOCUS RING
EYEPIECE ASSEMBLY
STEP 1. UNTHREAD EYEPIECE ASSEMBLY FROM FOCUSING TUBE IN COUNTER-CLOCKWISE DIRECTION.
STEP 2. UNTHREAD RANGE FOCUS RING FROM FOCUSING TUBE IN COUNTER-CLOCKWISE DIRECTION.
EL22G018

Figure 5–5. Eyepiece and Range Focus Ring Removal

5–11. Image Intensifier Assembly

(fig. 5–6)

a. Removal.

NOTE

Do not attempt to remove the image intensifier assembly from the focusing tube until the oscillator has been removed.

(1) Remove the oscillator (fig. 5–4).

(2) Remove the eyepiece assembly (fig. 5–5).

(3) Remove the range focus ring (fig. 5–5).

WARNING

The image intensifier assembly phosphor screens contain toxic material. If an assembly is broken, avoid inhalation of the phosphorous material and do not allow it to come in contact with the mouth, or open skin wounds.

NOTE

Gently strike the battery compartment with the hand. Do not allow the image intensifier assembly to fall and become damaged.

(4) Carefully remove the image intensifier assembly from the focusing tube.

CAUTION

The image intensifier assembly, when removed from the focusing tube, normally will have a residual high-voltage charge.

This charge can be removed by following the procedures given in (5) and (6) below.

(5) Carefully touch the oscillator contact pin on the image intensifier assembly to the focusing tube until the charge is removed.

(6) Carefully touch the ground contact ring on the image intensifier assembly to the focusing tube until the charge is removed. Do not damage the end of the image intensifier assembly.

(7) Remove the contact ring (fig. 5–13) from the focusing tube.

b. Testing. The only method of testing for a defective image intensifier assembly is by the substitution of a known good image intensifier assembly.

c. Cleaning.

(1) Before replacement of the image intensifier assembly, be sure that the glass surfaces on the image intensifier assembly, the ground contact ring, and the convolution face are free of oil, fingerprints, dust, or other foreign matter. Clean the convolution face with a lens tissue which has been wet with alcohol.

(2) Remove any oil, dirt, or corrosion from the contact ring.

d. Replacement.

(1) Loosen adjusting sleeve (19, fig. 5–13). If adjusting sleeve is stuck, remove power supply assembly (fig. 5–10) and slide focusing tube out of the image tube housing assembly (fig. 5–16). Use a

screwdriver or similar tool to free the adjusting sleeve.

(2) By trial, position the adjusting sleeve so that the following two conditions are satisfied when the sight is assembled:

(a) The fiber collar of the range focus ring is snugly captured between the focusing tube and the eyepiece assembly. (Concentric colored rings may be seen through the eyepiece if the positioning is not correct.)

(b) The observed image does not become defocused when the sight is tilted and rapped on the side.

NOTE

The adjusting sleeve must be finally positioned so that the contact pin on the image intensifier assembly is properly oriented for oscillator connections. (fig. 5–4)

(3) Install the contact ring (18, fig. 5–13) in the focusing tube with the raised contact facing out. Align the slot in the contact ring with the lower slot in the adjusting sleeve.

(4) Carefully insert the image intensifier assembly, with the alignment pin first, in the focusing tube.

(5) Rotate the image intensifier assembly slightly to be sure the alignment pin slips into the slots of the contact ring and adjusting sleeve.

(6) Install the oscillator (para 5–8).

(7) Install the range focus ring (para 5–10).

(8) Install the eyepiece assembly (para 5–9).

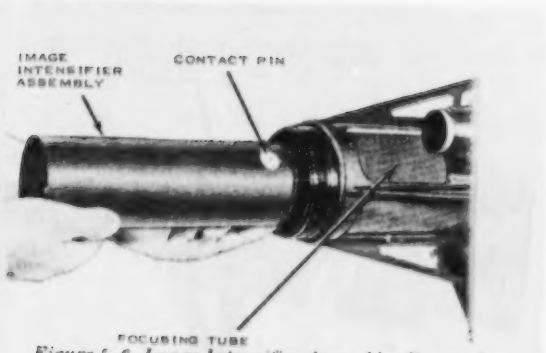
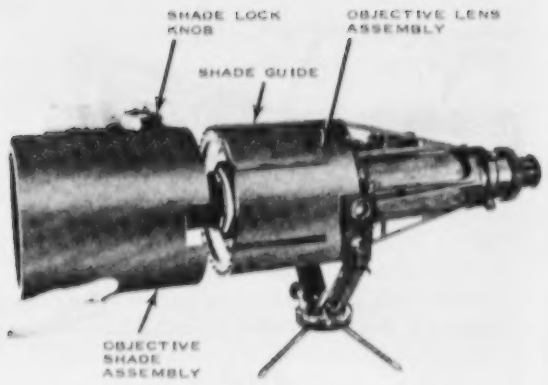


Figure 5–6. Image Intensifier Assembly, Removal

5–12. Objective Shade Assembly

a. Removal. Remove the objective shade assembly, as shown in figure 5–7.

b. Replacement. Replace the objective shade assembly, as shown in figure 5–7.



REMOVAL

STEP 1. LOOSEN SHADE LOCK KNOB

STEP 2. PULL OBJECTIVE SHADE ASSEMBLY OFF OF FRONT OF OBJECTIVE LENS ASSEMBLY

REPLACEMENT

STEP 1. POSITION OBJECTIVE SHADE ASSEMBLY SO THAT SHADE CLAMP (INSIDE OF SHADE) FITS INTO SHADE GUIDE

STEP 2. PUSH OBJECTIVE SHADE ASSEMBLY ONTO OBJECTIVE LENS ASSEMBLY

STEP 3. TIGHTEN SHADE LOCK KNOB

EL220059

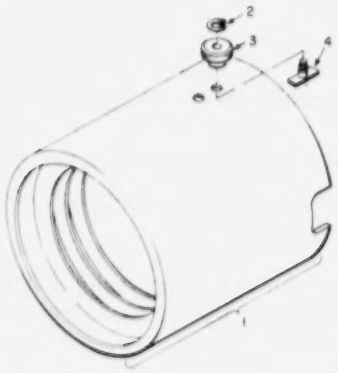
Figure 5-7. Objective Shade Assembly, Removal and Replacement

5–13. Shade Lock Knob and Clamp

a. Removal. Remove the shade lock knob and clamp, as shown in figure 5–8.

b. Repair. Replace the parts that are damaged.

c. Replacement. Replace the shade lock knob and clamp by reversing the procedures given in figure 5–8.



STEP 1 REMOVE RETAINING RING (2) FROM TOP OF SHADE CLAMP (4)
STEP 2 UNTHREAD SHADE LOCK KNOB (3) FROM SHADE CLAMP
STEP 3 REMOVE SHADE CLAMP FROM OBJECTIVE SHADE ASSEMBLY (1)

EL2ZG021

Figure 5–8. Shade Lock Knob and Clamp, Removal

5–14. Objective Lens Assembly

a. Removal

(1) Slide the objective shade assembly all the way toward the image tube housing.

(2) Tighten the shade lock knob.

(3) Tighten the elevation lock knob.

(4) Place the night sight on a work surface, as shown in figure 5–9, and follow the procedures given for removing the image tube housing assembly.

b. Inspection.

(1) Inspect the o-ring for damage or deterioration.

(2) Inspect the lenses for scratches or breaks.

(3) Visually inspect the interior of the lens assembly for condensation.

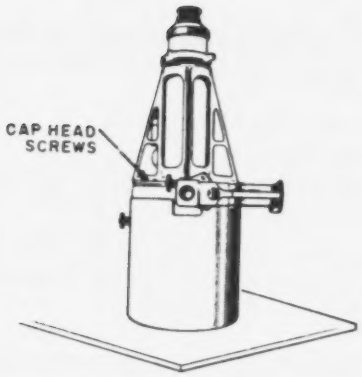
c. Cleaning. Refer to paragraph 3–4 for procedures on cleaning glass and metal surfaces.

d. Repair.

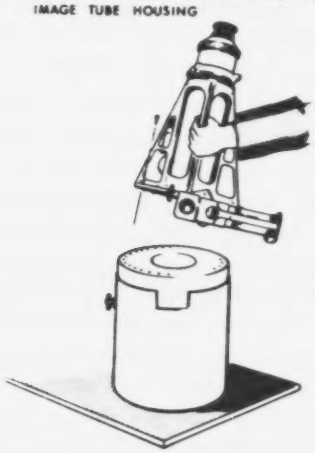
(1) Replace the o-ring when it is damaged or deteriorated. Lubricate with silicon (MIL–S–8660).

(2) Replace the objective lens assembly with a new objective lens assembly if an inspection reveals any damage or condensation.

e. Replacement. Replace the objective lens assembly by reversing the procedures given in figure 5–9.



STEP 1. REMOVE CAP HEAD SCREWS (18) FROM AROUND IMAGE TUBE HOUSING



STEP 2. GRASP IMAGE TUBE HOUSING IN BOTH HANDS AND RAISE AWAY FROM OBJECTIVE LENS ASSEMBLY

ELZG022

Figure 5–9. Objective Lens Assembly, Removal

5–15. Power Supply Assembly

a. Removal.

(1) Remove the battery from the power supply assembly (figure 2–4).

(2) Remove the oscillator from the power supply assembly (figure 5–4).

(3) Remove the power supply assembly from the image focusing tube, as shown in figure 5–10.

b. Inspection.

(1) Check the wiring for evidence of damage or deterioration.

(2) Check the wiring and the switch for continuity.

(3) Inspect the gasket for damage or deterioration.

c. Disassembly (Serial Numbers 1027 through 1065) (fig. 5–11).

(1) *Toggle switch.* Remove the toggle switch from the power supply housing as follows:

(a) Remove the locknut (9), the lockwasher (8), the switch guard (7), and the seal bushing (6), from the top of the toggle switch (20).

(b) Remove the toggle switch (20) and the seal bushing (21) from the power supply housing.

(2) *Ground clips.* Remove the four screws (22), the lockwashers (23), and the holding ground clips (10) from the underside of the power supply housing (5) at the oscillator housing.

(3) *Battery terminal.* Unsolder the wire lead (17) from the switch and push the battery terminal

(19) (located at the end of the battery housing) from inside of the toggle switch housing until it comes loose.

NOTE

The battery terminal is forced-fit in the battery housing and may require considerable pressure for removal.

(4) *Battery spring.* Twist and pull the battery spring (2) inside the battery cap (1) to remove it from the battery cap (1).

(5) *Oscillator insulator.* The oscillator insulator (14) is attached to the inside of the oscillator cap (13) with sealing compound (EC 801). Pry the oscillator insulator (14) until it separates from the oscillator cap (13).

d. Disassembly (Serial Numbers 2101 and Up).

(1) *Toggle switch* (fig. 5–12). Remove toggle switch from power supply housing as follows:

(a) Remove the hexagonal nut (8) from the top of the toggle switch (9).

(b) Remove the toggle switch (9) from the power supply housing (7) and unsolder the wire leads (11) from the toggle switch (9).

(2) *Oscillator ground and wiper contacts.* Unsolder the wire lead (11) from the ground contact (13). Remove the four screws (15) and the washers (14) that hold the ground contacts (13) and the wiper contacts (12) to the underside of the power supply housing (7).

(3) *Battery terminal.* Unsolder the wire lead (11) from the battery terminal (5), and push or pry

the battery terminal (5) and the terminal insulator (6) (located at end of the battery housing) from the inside of the toggle switch housing.

NOTE

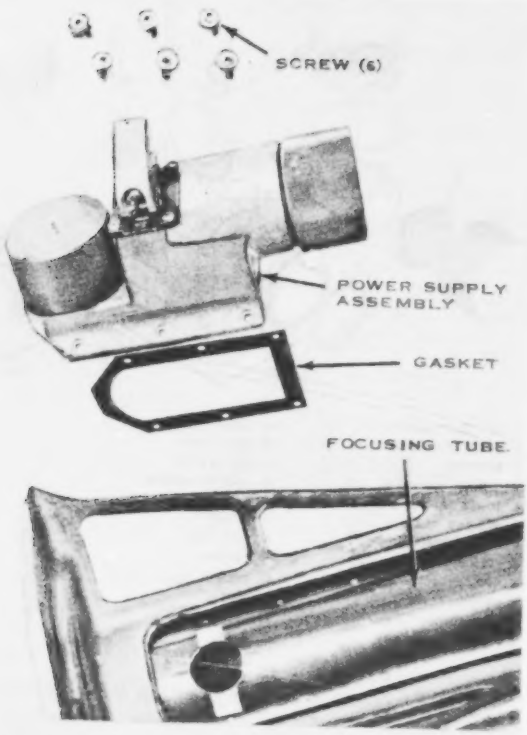
The battery terminal and insulator are press-fitted into the battery housing and may require considerable pressure for removal.

(4) *Battery spring.* Twist and pull the battery and oscillator springs (3) to remove them from the battery and oscillator caps (1) and remove the o-rings (2) from the caps (1).

e. Repair. All the components in the power supply assembly are nonrepairable and must be replaced if they are unserviceable.

f. Reassembly. Reassemble the power supply assembly by reversing the procedures given in *c* above.

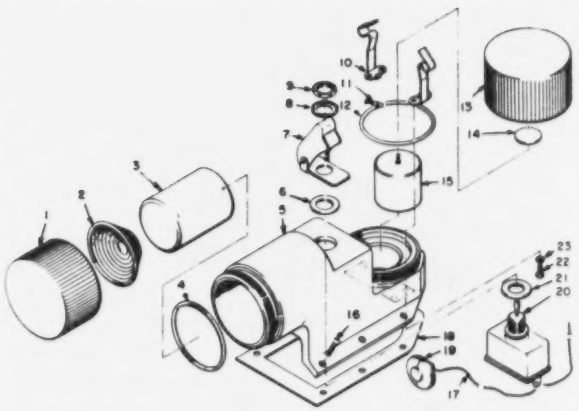
g. Replacement. Replace the power supply assembly by reversing the procedures given in *a* above.



STEP 1. REMOVE BATTERY
STEP 2. REMOVE OSCILLATOR
STEP 3. UNSCREW SCREWS (6) AND WASHERS (6) AT BASE OF POWER SUPPLY ASSEMBLY
STEP 4. REMOVE POWER SUPPLY ASSEMBLY AND GASKET FROM FOCUSING TUBE

EL2ZG023

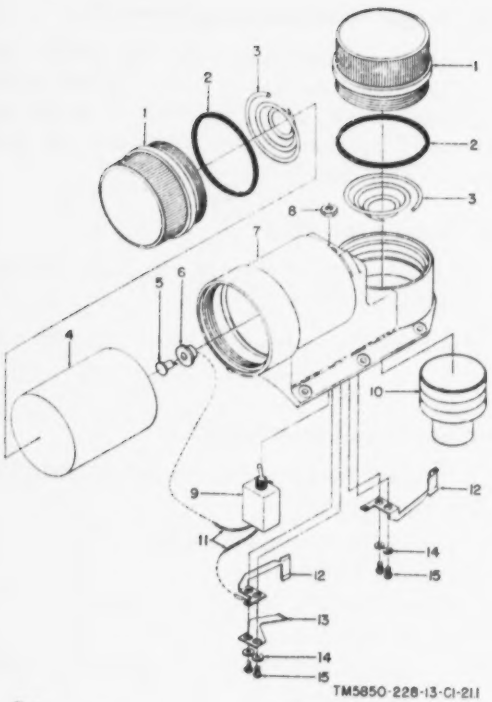
Figure 5–10. Power Supply Assembly Removal



1. BATTERY CAP
2. BATTERY SPRING
3. BATTERY
4. O-RING (PACKING)
5. POWER SUPPLY HOUSING
6. BUSHING SEAL
7. SWITCH GUARD
8. LOCKWASHER
9. NUT
10. GROUND CLIPS
11. CONNECTOR
12. O-RING (PACKING)
13. OSCILLATOR CAP
14. INSULATOR
15. OSCILLATOR
16. SEALING SCREW
17. WIRE
18. GASKET
19. TERMINAL
20. SWITCH
21. BUSHING SEAL
22. SCREW
23. LOCKWASHER

EL2ZG024

Figure 5-11. Power Supply Assembly, Exploded View



1	Cap	9	Toggle switch
2	O-ring	10	Oscillator
3	Spring	11	Wire
4	Battery	12	Wiper contact
5	Battery terminal	13	Ground contact
6	Terminal insulator	14	Washer
7	Power supply housing	15	Screw
8	Hexagonal nut		

EL2ZG025

Figure 5-12. Power Supply Assembly (Serial Numbers 2101 and Up). Exploded View.

5–16. Image Tube Housing Assembly

Direct support maintenance on the image tube housing assembly consists of removing and replacing mechanical parts as required. Removal and replacement procedures are contained in paragraphs 5–17 through 5–24.

5–17. Yoke Assembly

a. Remove the capscrew (10, fig. 5–13) by turning it counterclockwise.

b. Use a spanner wrench to remove the trunnion (9).

5–18. Elevation Lock Knob

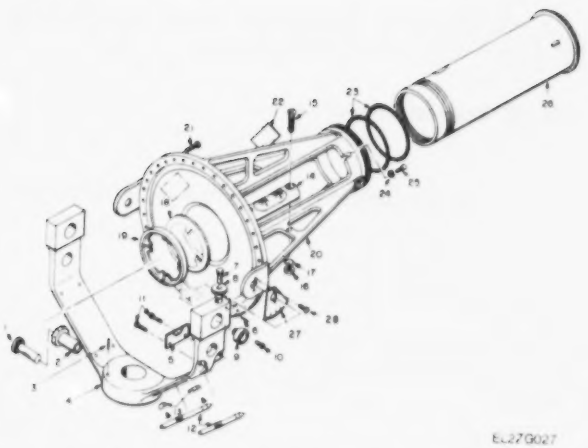
a. Removal. Remove the elevation lock knob from the yoke as follows:

(1) Drive the spring pin (6 fig. 5–13) out of the yoke (4) with a pindriver.

(2) Remove the elevation lock stud (7) from the yoke (4).

(3) Unthread the elevation lock knob (8) from the elevation lock stud (7).

b. Repair. All the components of the elevation lock knob are nonrepairable and must be replaced if they are unserviceable.



EL27G027

1 Lock stud, azimuth
2 Azimuth lock knob
3 Spring pin
4 Yoke
5 Elevation vernier
6 Spring pin
7 Lock stud, elevation
8 Elevation lock knob
9 Trunnion (2)
10 Cap screw (2)
11 Screws, pan head (2)
12 Legs (3)
13 Spring clips (6)
14 Level vial
15 Screw, flat head
16 Nut, hex
17 Lock washer
18 Contact ring
19 Adjusting sleeve
20 Image tube housing
21 Screw, cap head (18)
22 Name plate
23 O-ring (packing)
24 Lock washer
25 Special screw
26 Focusing tube
27 Elevation dial
28 Drive screw (2)

Figure 5–13. Image Tube Housing Assembly, Exploded View.

c. Replacement. Replace the elevation lock knob by reversing the procedures given in *a* above.

5–19. Elevation Vernier

(fig. 5–13)

a. Removal. Remove the elevation vernier from the yoke as follows:

(1) Remove the screw (11).

(2) Remove the elevation vernier (5).

b. Replacement. Replace the elevation vernier on the yoke by reversing the procedures given in *a* above.

5.20. Azimuth Lock Knob

(fig. 5–13)

a. Removal. Remove the yoke mount lock knob from the yoke as follows:

(1) Drive the spring pin (3) out of the yoke with a pindriver.

(2) Remove the azimuth lock stud (1) from the yoke (4).

(3) Unthread the yoke mount lock knob (2) from the azimuth lock stud (1).

b. Repair. All the components of the yoke mount lock knob are nonrepairable and must be replaced if they are unserviceable.

c. Replacement. Replace the yoke mount lock knob on the yoke by reversing the procedures given in *a* above.

5–21. Level Vial

(fig. 5–13)

a. Removal. Remove the level vial from image tube housing assembly as follows:

(1) Remove the hexagonal nut (16), the lockwasher (17), and the flathead screw (15).

(2) Remove the level vial (14).

b. Repair. Replace the level vial by reversing the procedures given in *a* above.

c. Replacement. Replace the level vial by reversing the procedures in *a* above.

5–22. Elevation Dial

a. Removal. Remove the yoke (fig. 5–14) (para 5–17) and the elevation dial from the image tube housing, as shown in figure 5–14.

b. Repair. Replace the elevation dial if it is unserviceable.

c. Replacement. Replace the elevation dial on the image tube housing by reversing the procedures shown in figure 5–14.

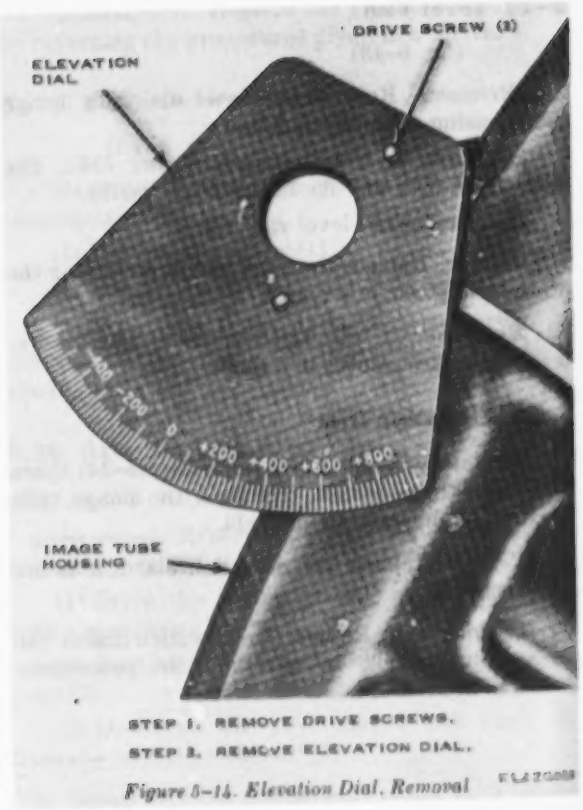


Figure 5–14. Elevation Dial, Removal

5–23. Stop Ring

a. Removal.

(1) Remove the eyepiece assembly (fig. 5–5).

(2) Remove the stop ring, as shown in figure 5–15.

b. Repair. Replace the stop ring on the setscrew if either is unserviceable.

c. Replacement. Replace the stop ring by reversing the procedures given in *a* above.

Figure 5–15. Stop Ring, Removal

5–24. Focusing Tube

a. Removal.

(1) Remove the eyepiece assembly (fig. 5–5).

(2) Remove the power supply assembly (fig. 5–10).

(3) Remove the range focus ring and the stop ring (fig. 5–15).

(4) Remove the focusing tube (fig. 5–16).

b. Inspection.

(1) Inspect the focusing tube for dents or other mechanical damage.

(2) Inspect for burred or damaged threads.

(3) Inspect the o-rings for damage or deterioration.

c. Cleaning. Refer to paragraph 3–4 for procedures on cleaning metal surfaces.

d. Repair.

(1) Lubricate and replace the o-rings when they are damaged or deteriorated.

(2) Replace the focusing tube when an inspection reveals damage which renders the focusing tube unserviceable.

(3) Remove the burrs from the threads with a small file or an emery cloth.

e. Replacement. Replace the focusing tube by reversing the procedures given in figure 5–16.

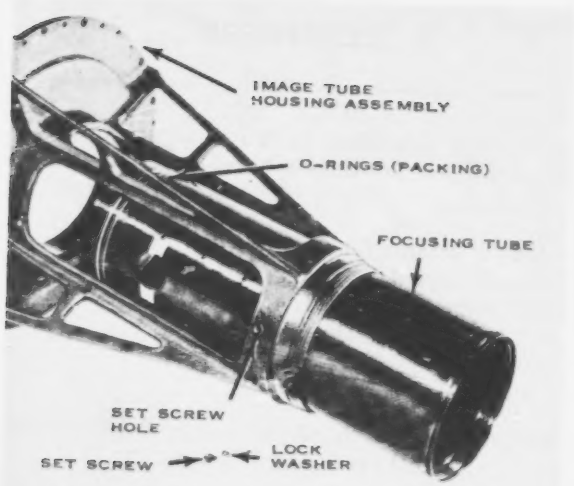


Figure 5-16. Focusing Tube, Removal

APPENDIX A
REFERENCES

The following is a list of applicable references available to the repair technician of the Night Vision Sight, Tripod Mounted.

DA Pam 310–4	Index of Technical Publications: Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310–7	US Army Index of Modification Work Orders.
TB 43–0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11–5855–237–23P	Organizational and Direct Support Maintenance Repair Parts and Special Tools List for the Night Vision Sight, Tripod Mounted.
TM 11–6625–366–15	Operator's, Organizational, DS, GS, and Depot

	Maintenance Manual: Multimeter TS-352B/U.
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 740-90-1	Administrative Storage of Equipment.
TM 750-116	Organization, Direct Support, and General Support Maintenance Procedures for Purging and Charging of Fire Control Instruments.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B
COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B–1. Scope

This appendix lists integral components of and basic issue items for the AN/TVS–4 and AN/TVS–4A to help you inventory items required for safe and efficient operation.

B–2. General

This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the AN/TVS and AN/TVS–4A and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the AN/TVS–4 and AN/TVS–4A in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the AN/TVS–4 and AN/TVS–4A during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

B–3. Explanation of Columns

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item number.* The number used to identify item called out in the illustration.

b. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

c. Description. Indicates the Federal item name and, if required, a minimum description to identify the item. The part number indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. Following the part number, the Federal Supply Code for Manufacturers (FSCM) is shown in parentheses.

d. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

e. Usable on Code. Not applicable.

f. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

g. Quantity. This column is left blank for use during an inventory. Under the Rcvd column, list

the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item.

(Next printed page is B-2)

SECTION II INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
		5855-00-138-2364	ADAPTER ASSEMBLY (80063) SC-C-627799			1		
		5855-00-451-8155	CASE, CY-6390A/TVS-4 (80063) SC-D-627820-4			1		
		5855-00-937-1187	COVER ASSEMBLY, EYEPIECE (80063) SC-D-627829			1		
		5855-00-937-2188	COVERASSEMBLY OBJECTIVE SC-D-627830			1		
		5855-00-053-8142	NIGHT VISION SIGHT, M3-M70LA/TVS-4 SC-D-627701			1		

SECTION III BASIC ISSUE ITEMS

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
		6230-00-171-3362	PENLIGHT MS21998 (96906)			1		
		5855-00-937-2182	LEG SC-C-627788 (80063)			1		
		8020-00-409-3000	LENS, BRUSH MIL-B-43363 (81349)			1		
		6640-00-240-5851	PAPER, LENS NNN-P40 (96906)			1		

APPENDIX C
ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

C–1. Scope

This appendix lists additional items you are authorized for the support of the AN/TVS–4 and AN/TVS–4A.

C–2. General

This list identifies items that do not have to accompany the AN/TVS–4 and AN/TVS–4A and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

C–3. Explanation of Listing

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment.

(Next printed page is C–2)

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
6135-00-926-0827	*BATTERY, DRY BA-1100/U; 80058	EA	1
6135-00-120-1092	*BATTERY, DRY BA-58; 80058	EA	2
5855-00-149-0766	EYEPIECE ASSEMBLY, BINOCULAR M9-1100/TVS-4; 80058	EA	1
6675-00-222-2505	TRIPOD AMERICAN TYPE 90-T-621; 81348	EA	1

* Dry batteries shown are used with the equipment. They will not be preshipped automatically but are to be requisitioned in quantities necessary for the particular organization in accordance with SB 11-6.

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APPENDIX D
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

D–1. General.

This appendix provides a summary of the maintenance operations for AN/TVS–4 and AN/TVS–4A. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

D–2. Maintenance Function.

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

D–3. Column Entries.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of

having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C–Operator/Crew
O–Organizational
F–Direct Support
H–General Support
D–Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support

equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

D–4. Tool and Test Equipment Requirements (Sect. III)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

D–5. Remarks (Sect. IV).

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

(Next printed page is D–4)

SECTION II MAINTENANCE ALLOCATION CHART FOR

NIGHT VISION SIGHT, TRIPOD MOUNTED AN/TVS-4, AN/TVS-4A

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
00	NIGHT VISION SIGHT, TRIPOD MOUNTED, AN/TVS-4 AND AN/TVS-4A	Inspect	0.1						
		Test			0.3			1,2	
		Test					0.5		
		Service	0.1						
		Install	0.1						A
		Repair		0.1					
		Repair			0.5			1,2	B
		Overhaul					10.0		
01	CASE ASSEMBLY, CARRYING	Inspect	0.1						
		Service	0.1						
		Replace		0.1					
		Repair		0.1					C
		Repair			0.3			1	
02	NIGHT VISION SIGHT, TRIPOD MOUNTED	Inspect	0.1						
		Test			0.3			1,2	
		Test					0.5		
		Service	0.1						
		Install	0.1						
		Repair			0.5			1,2	D
		Repair					10.0		
0201	OBJECTIVE LENS ASSEMBLY	Inspect			0.1				
		Test					0.5	1	
		Replace			0.2			1	
		Repair			0.3				E
		Repair					0.5		
0202	EYEPIECE ASSEMBLY	Inspect			0.1				
		Test					0.3		
		Replace			0.1			1	
		Repair		0.1					F
		Repair					1.0		

0201	ADAPTER ASSEMBLY	Inspect	0.1						
		Install	0.1						
		Replace		0.2					
		Repair			0.3			1,3	
03	IMAGE TUBE HOUSING, ASSEMBLY	Inspect	0.1						
		Test			0.3				
		Replace			0.3			1	
		Repair			0.6			1,2,3	G
0301	POWER SUPPLY ASSEMBLY	Test			0.3			1,2	
		Replace			0.3				
		Repair	0.1						H
		Repair		0.1					I
		Repair			0.5			1,2	J
0302	IMAGE INTENSIFIER ASSEMBLY	Inspect			0.1				
		Test					0.5		
		Replace			0.1			1	
		Repair					2.0		
0303	YOKE ASSEMBLY	Inspect	0.1						
		Repair			0.5				K
04	EYEPIECE ASSEMBLY, BIOCULAR	Inspect	0.1						
		Service	0.1						
		Install			0.1				
		Repair	0.1						L
		Repair			0.1				M
		Repair					1.0		N

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
NIGHT VISION SIGHT, TRIPOD MOUNTED AN/TVS-4, AN/TVS-4A

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	F,H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
2	F,H,D	MULTIMETER TS-352/U	6625-00-242-5023	
3	F,H,D	WRENCH, SPANNER TRUNNION	5120-00-937-2707	

SECTION IV REMARKS

REFERENCE CODE	REMARKS
A	BY REPLACEMENT OF EYEPIECE AND OBJECTIVE COVERS AND O1.
B	BY REPLACEMENT OF O3.
C	BY REPLACEMENT OF CUSHIONS.
D	BY REPLACEMENT OF O201, O202.
E	BY REPLACEMENT OF OBJECTIVE SHADE ASSEMBLY, ASSOCIATED HARDWARE.
F	BY REPLACEMENT OF EYESHIELD.
G	BY REPLACEMENT OF O301, O302.
H	BY REPLACEMENT OF BATTERY.
I	BY REPLACEMENT OF BATTERY CAP AND O-RING.
J	INCLUDES REPLACEMENT OF OSCILLATOR.
K	BY REPLACEMENT OF MISCELLANEOUS HARDWARE.
L	BY REPLACEMENT OF BIOCULAR EYESHIELD.
M	BY REPLACEMENT OF PROTECTIVE CAPS, PREFORMED PACKING.
N	BY REPLACEMENT OF REAR LENS CELL, FRONT AND REAR CONVEX-CONCAVE LENSES, PREFORMED PACKING, FRONT AND REAR LENS RETAINER, FRONT LENS SLEEVE SPACER, AND MISCELLANEOUS HARDWARE.

APPENDIX E
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E–1. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the AN/TVS–4 and AN/TVS–4A. These items are authorized to you by CTA 50–970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E–2. Explanation of Columns

a. Column 1—Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2—Level. This column identifies the lowest level of maintenance that requires the listed item.

C—Operator/Crew
O—Organizational Maintenance
F—Direct Support Maintenance
H—General Support Maintenance

c. Column 3—National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4—Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5—Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

(Next printed page is E-2)

SECTION II EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NO AND FSCM	(5) UNIT OF MEAS
1	C	6640-00-260-5851	PAPER, TISSUE NNR-P40; W/XX	EA

By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

Active Army:

HISA (Ft Monmouth) (26)
USAINSCOM (2)
COE (1)
TSG (1)
USAARENBD (1)
DARCOM (1)
TRADOC (2)
OS MAJ COMD (4)
TECOM (2)
USACC (4)
MDW (1)
Armies (2) except
  7th USA (5)
  8th USA (5)
Corps (2)
Svc Colleges (1)
USASIGS (5)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAICS (3)
MAAG (1)
USARMIS (1)
USAERDAA (1)
USAERDAW (1)
Ft Carson (5)
Ft Gillem (10)
Ft Gordon (10)
Ft Huachuca (10)
Ft Richardson
  (CERCOM Ofc) (2)
Army Dept (1) except
  LBAD (14)
  SAAD (30)
  SHAD (3)
  TOAD (14)
USA Dept (1)
Sig Sec USA Dep (1)
Units org under fol TOE:
(1 cy ea unit, UNIONIC)
29–207 (2)
29–610 (2)
  6–155
  6–165
  6–365
  6–705
  7
  7–15
  7–16
  7–18
  7–35
  7–36
  7–37
  7–45
  7–46
  7–47

7–100
11–35
11–36
11–39
11–117
11–500 (AA–AC)
17
17–15
17–16
17–18
17–35
17–36
17–37
17–51
17–55
17–56
17–57
17–95
17–99
17–100
17–105
17–106
17–107
29–1
29–35
29–134
29–136
37
37–100
57
67

ARNG: (State AG (3); Units—Same as Active Army except allowance is one copy per unit.

USAR: None

For explanation of abbreviations used, see AR 310–50.

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